

GIS in STEM Education

GIS Day 2014 – University of Kansas

November 19, 2014

Thomas R. Baker

@trbaker

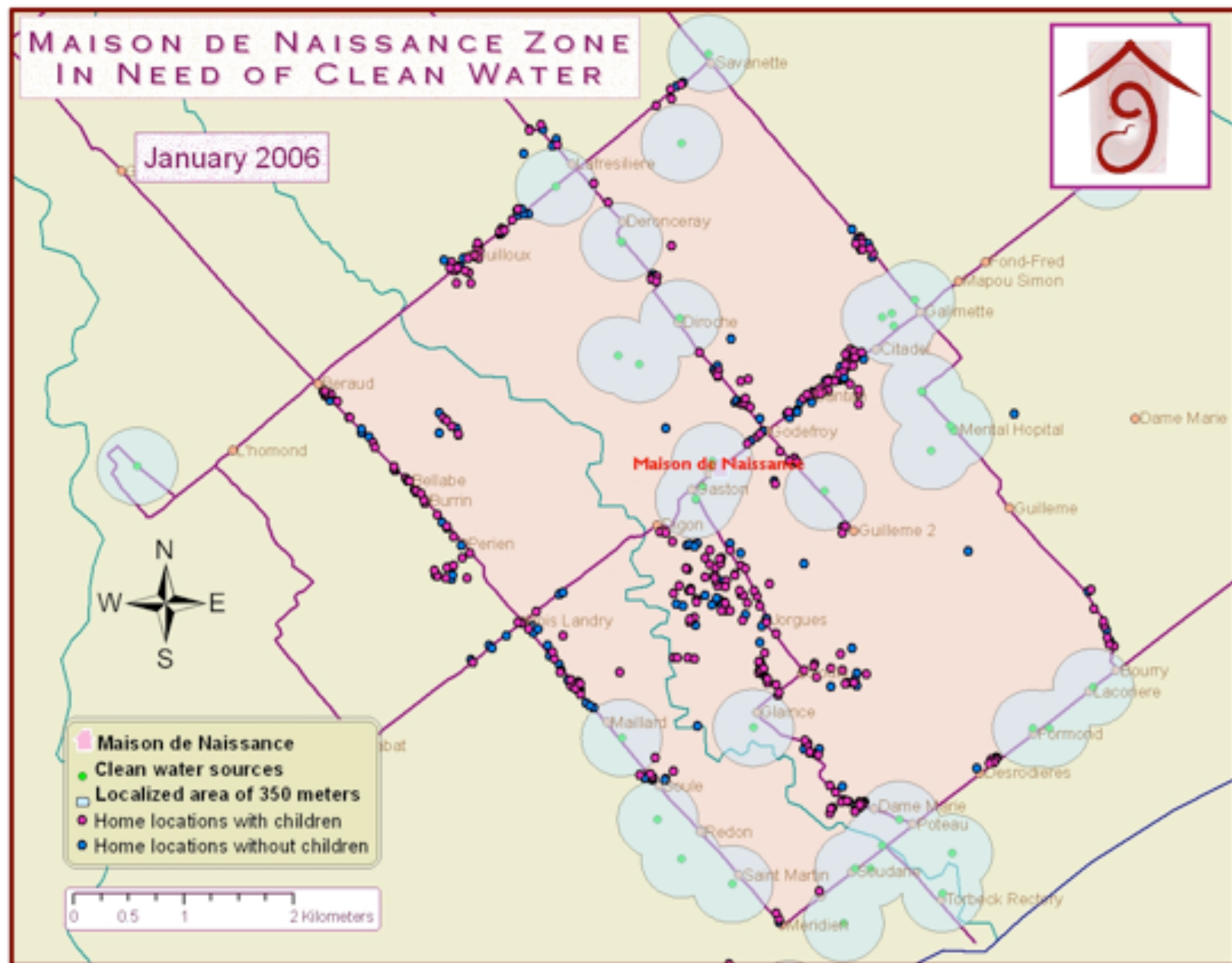
tbaker@esri.com

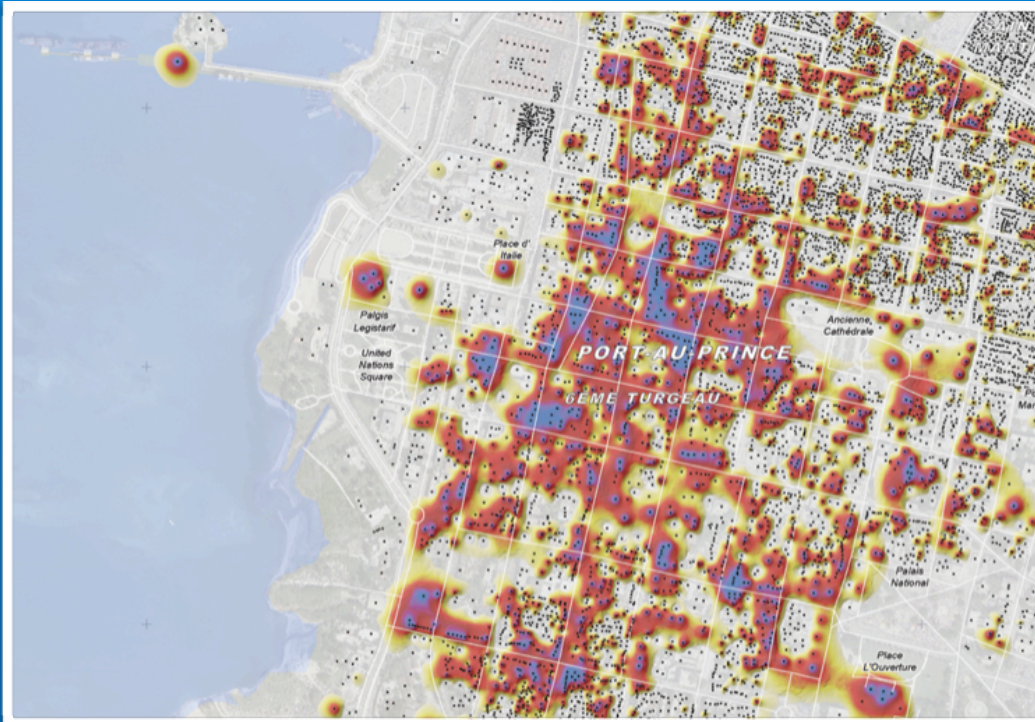
Esri Education Manager

Adjunct Researcher, Center for STEM Learning
University of Kansas

Images used in this presentation:
gps.gov; esri.com; gis.com; garmin.com; popularmechanics.com

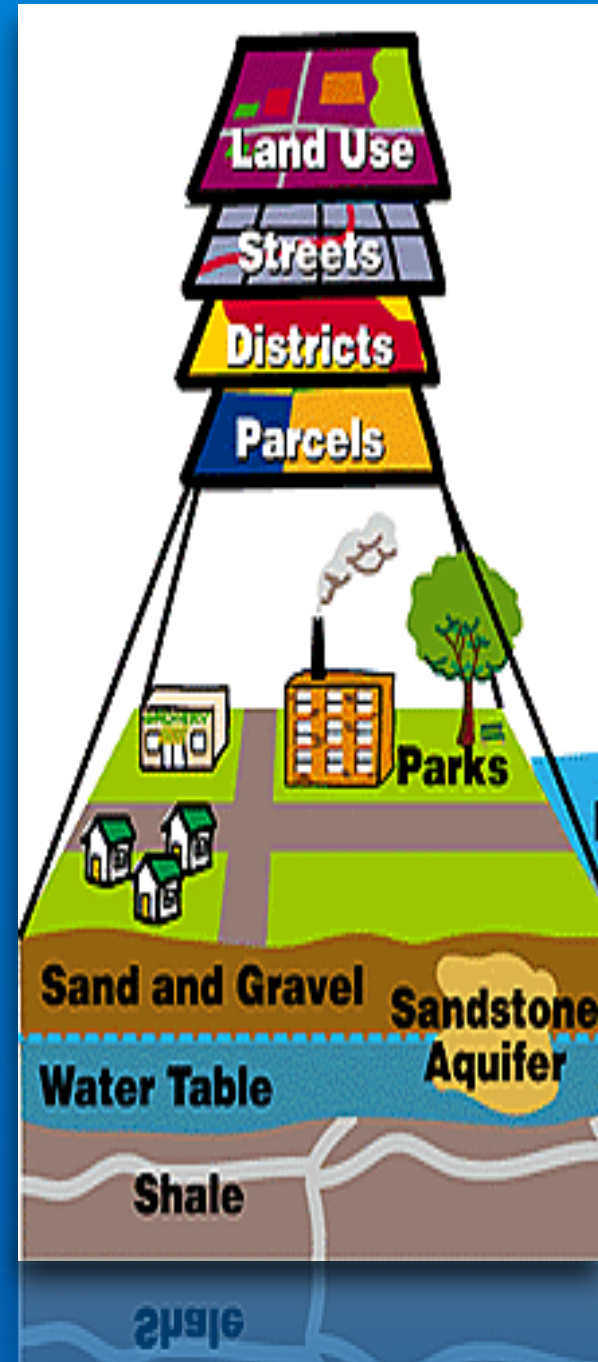






GeoSpatial Tech

What is GIS?

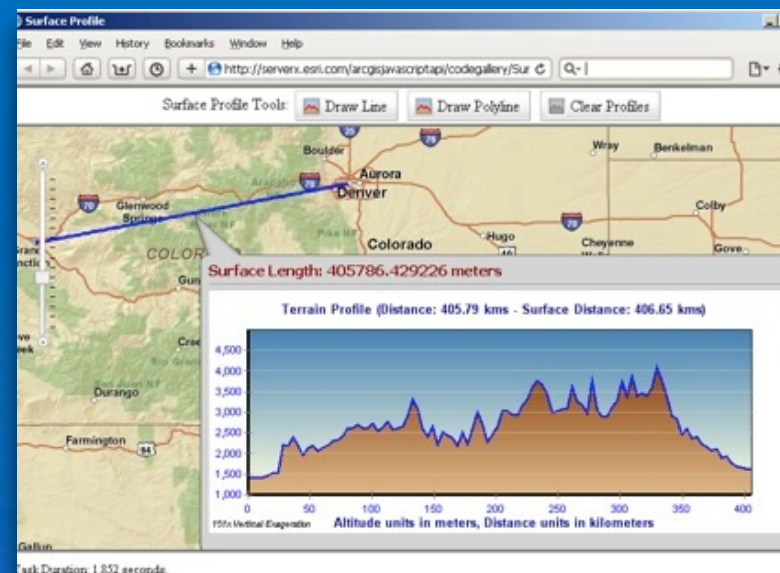
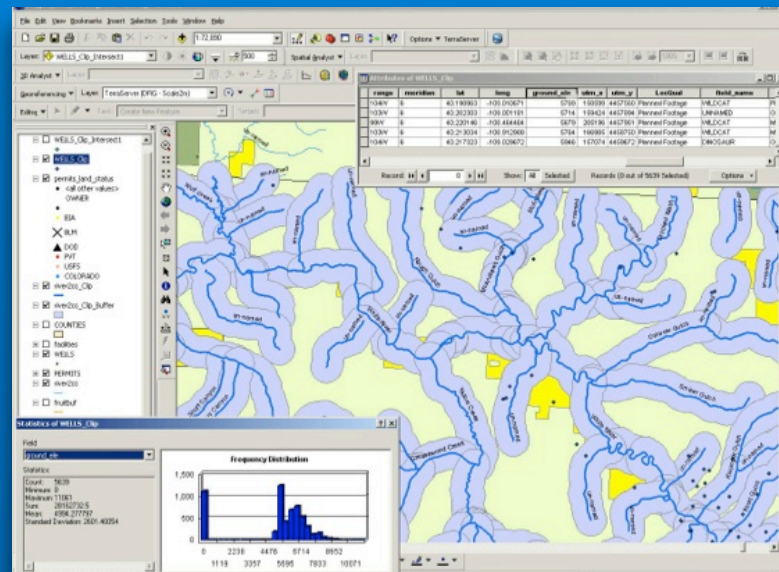
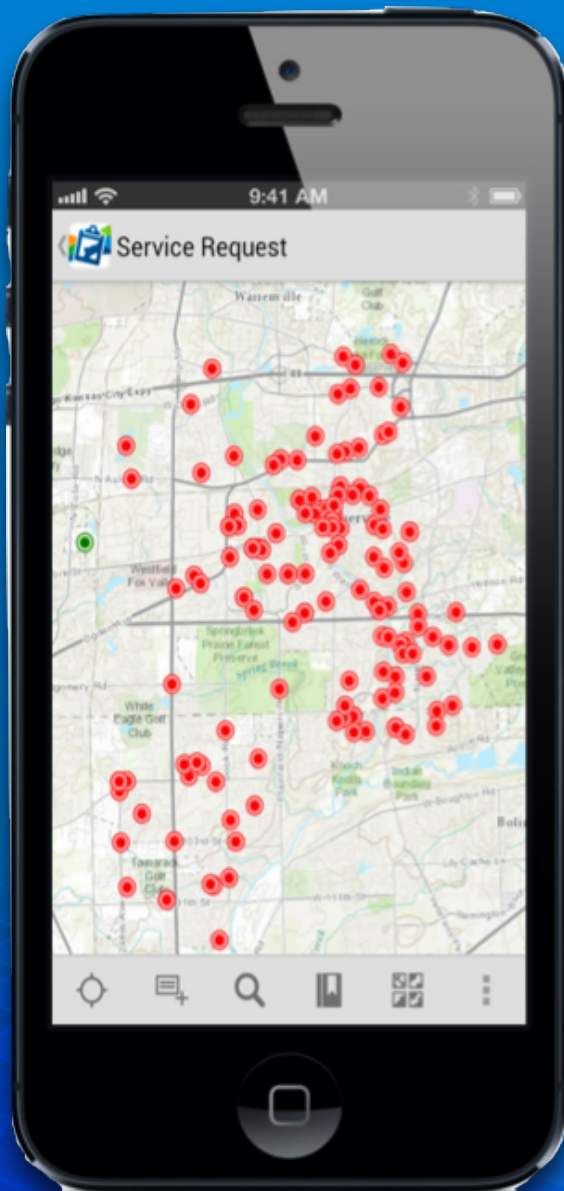




Layers

- ☒ capitals
- ☒ interstates
- ☒ rivers
- ☒ lakes
- ☒ states



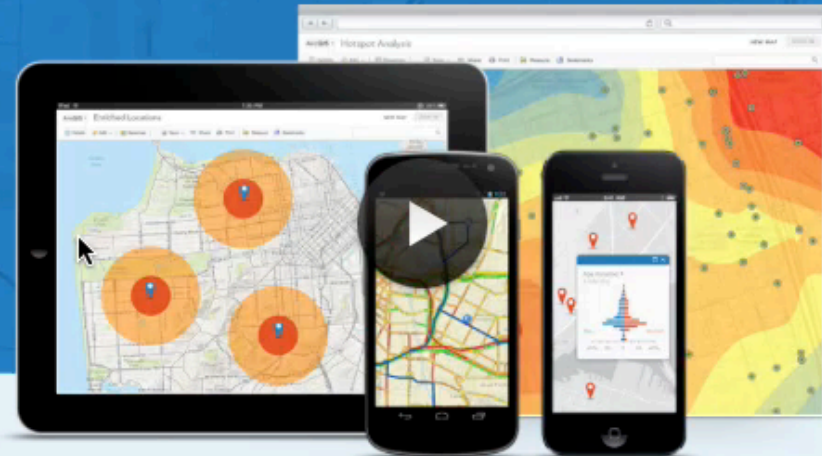


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<http://arcgis.com>



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The ConnectED initiative and Esri: Open Doors to Many Careers

Give students future options with high-value skills
in problem solving, data analysis, and technology integration.



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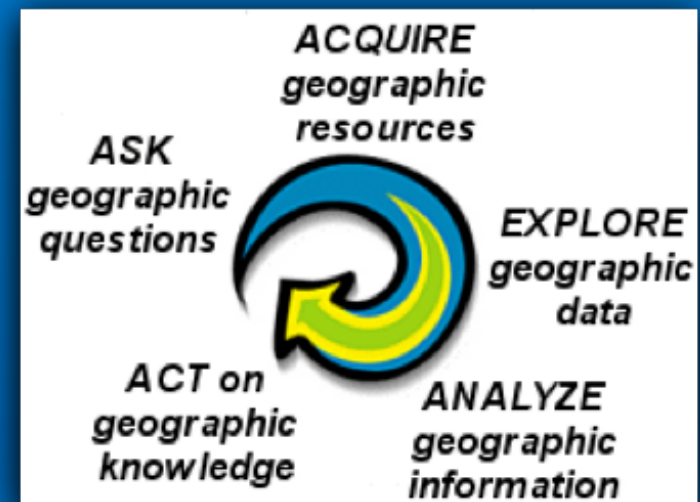
Start →

<http://connectED.esri.com>

Learning

A Tool for Thinkers

- Think about a topic or a place ...
- Ask a question about it ...
- Make a map ...
- Explore the patterns that appear ...
- Enhance the data or modify the analysis ...
- Ask a new question ...
- Repeat ...



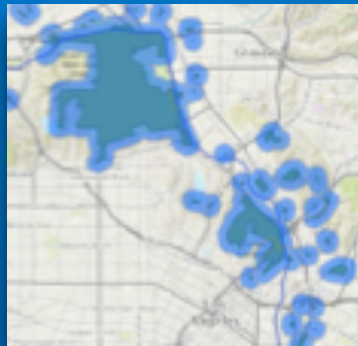
Why Use GIS in Schools?



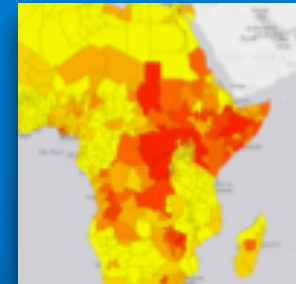
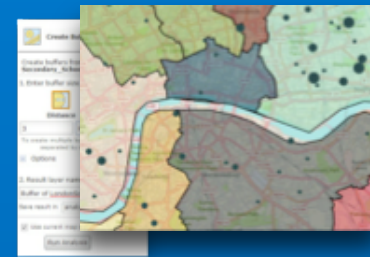
Data analysis
Critical thinking
Spatial thinking
Project-Based Learning
STEM
21st Century Skills
College & Career

Web-based Analysis

Summarize Within



Dissolve Boundaries



Extract Layer

Overlay Layers

Field Calculator

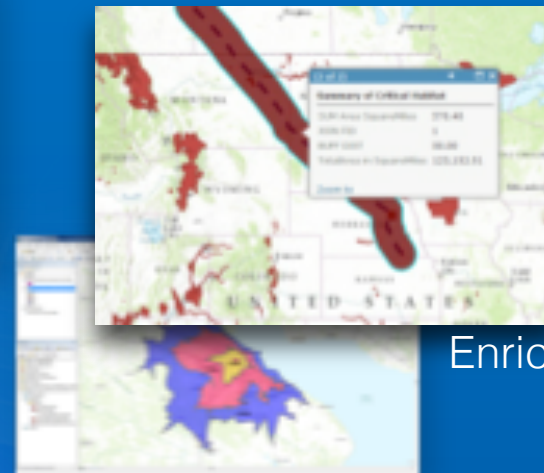
Merge Layers

Summarize Nearby



Create Buffers

Aggregate Points



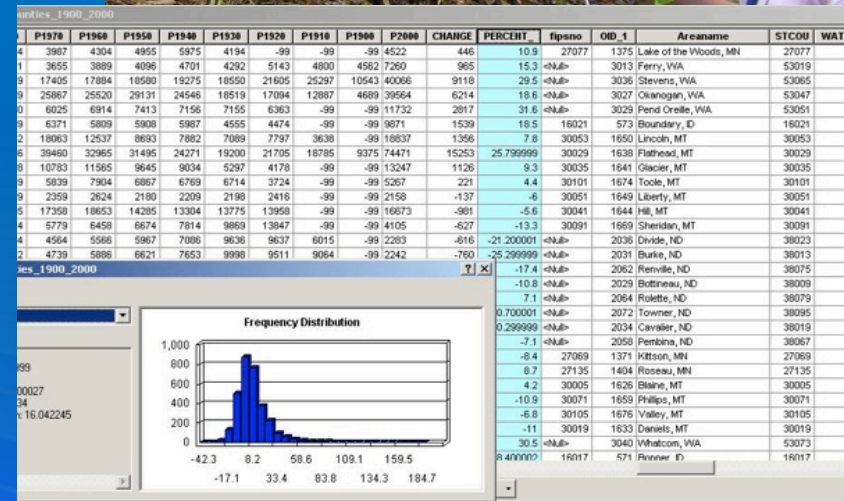
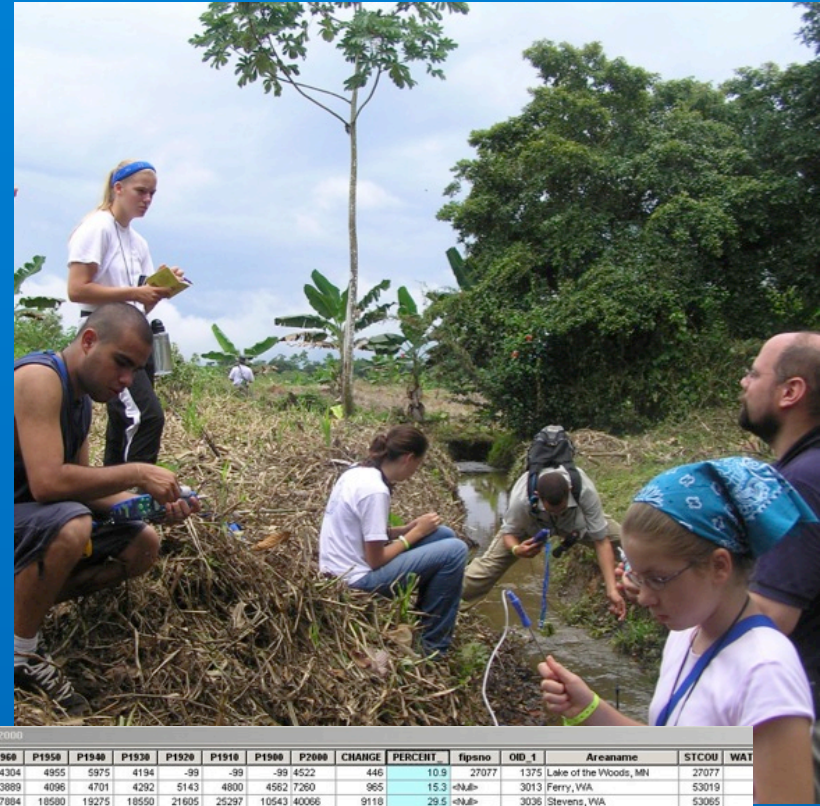
Enrich Layer

Find Nearest

Drive-Time Areas

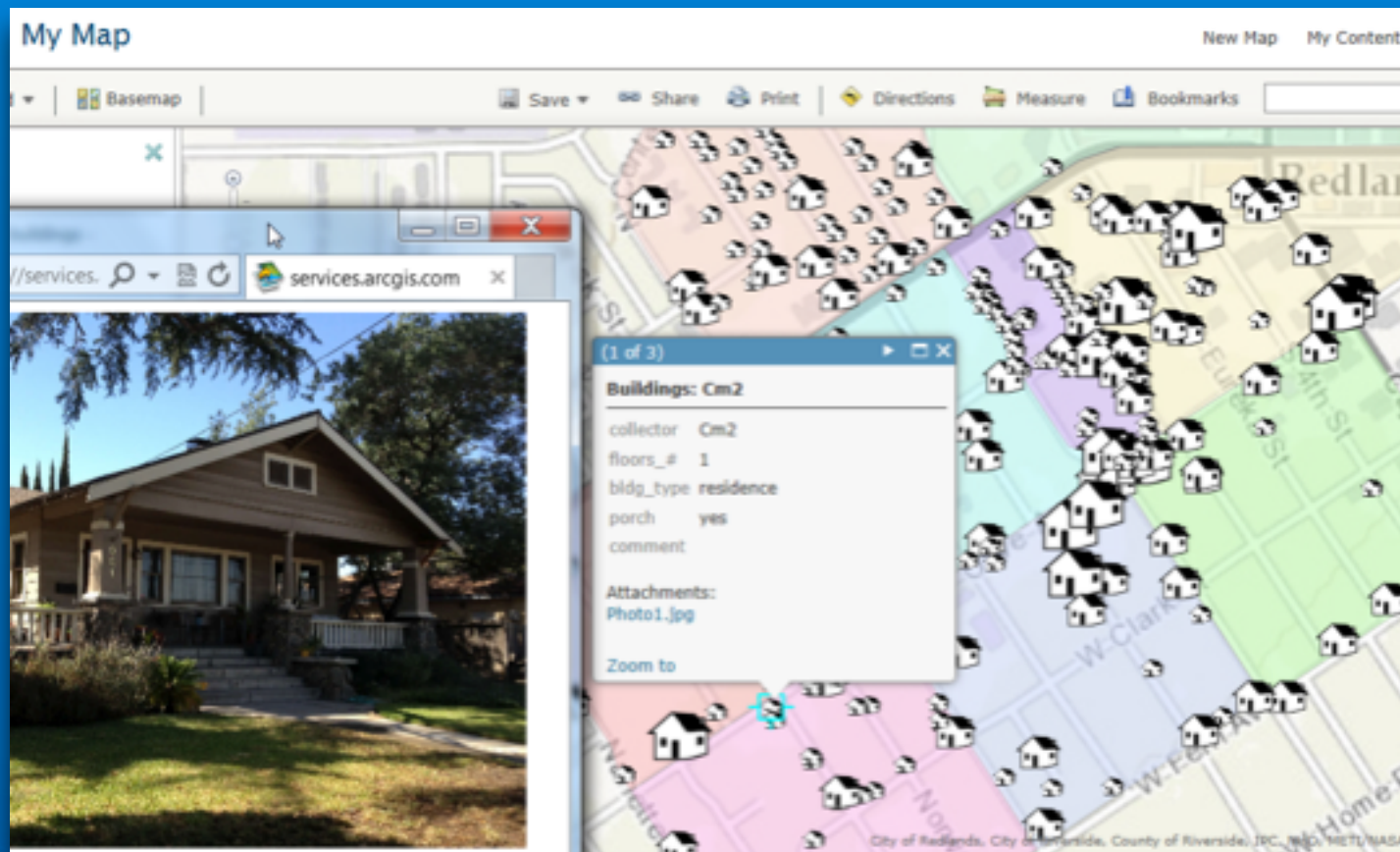
STEM

- National priority for education and workforce
- Guided by Next Gen Science Standards and Common Core State Standards for Math
- “science & engineering practices”
- Links to “spatial thinking”



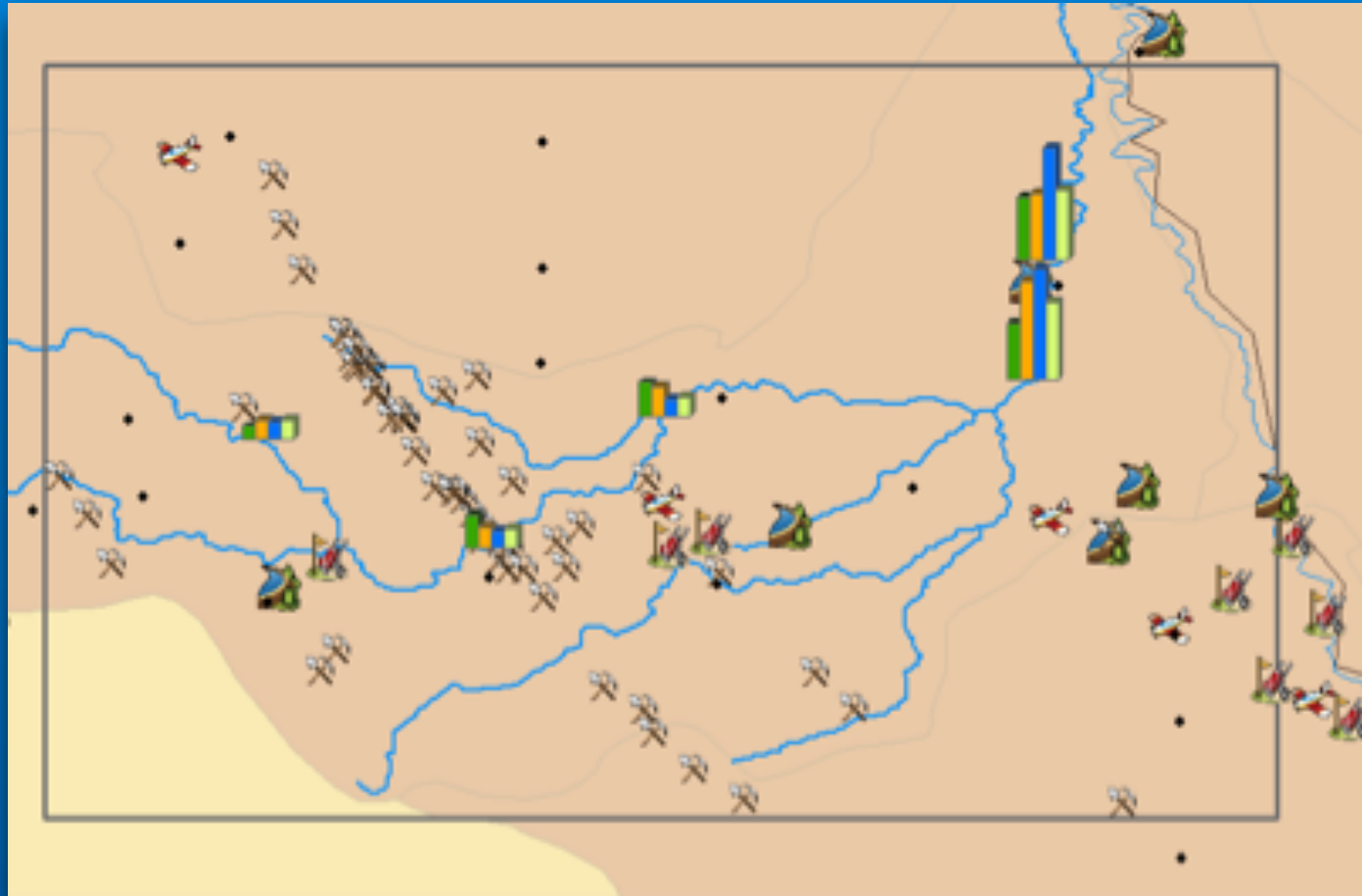
Field Studies





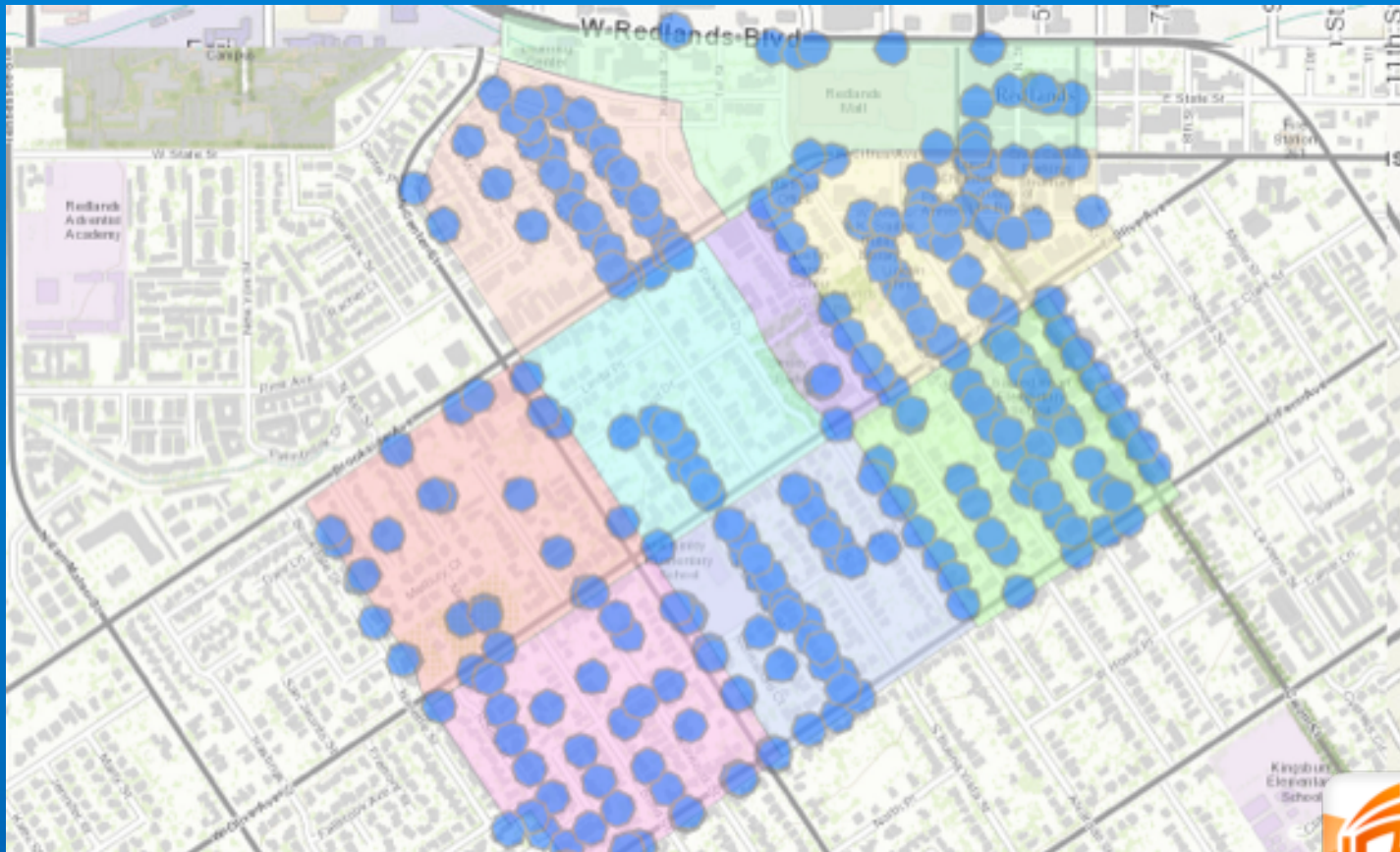
Neighborhoods & Architecture

Inventories of the built environment



Interpretative Talks

Trail or park exploration maps



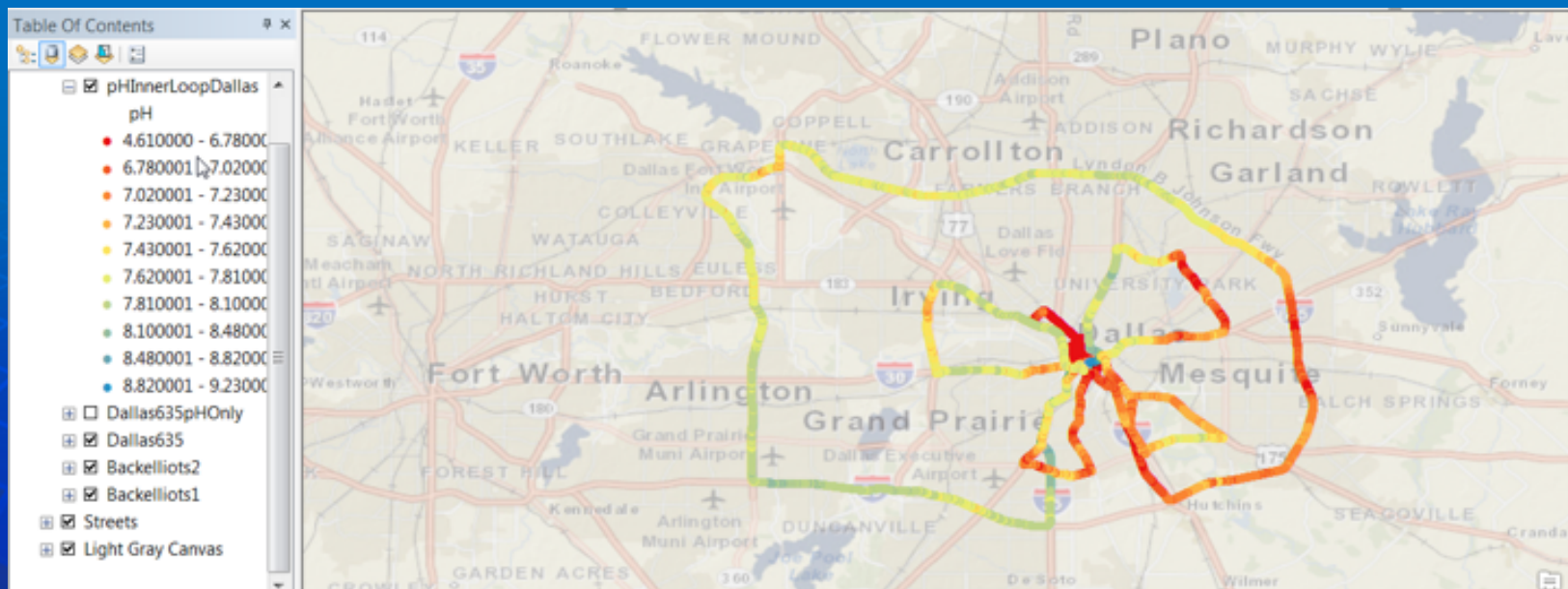
Community Street Light Coverage

Safety and security

Source: Esri T3G 2013

Air Quality

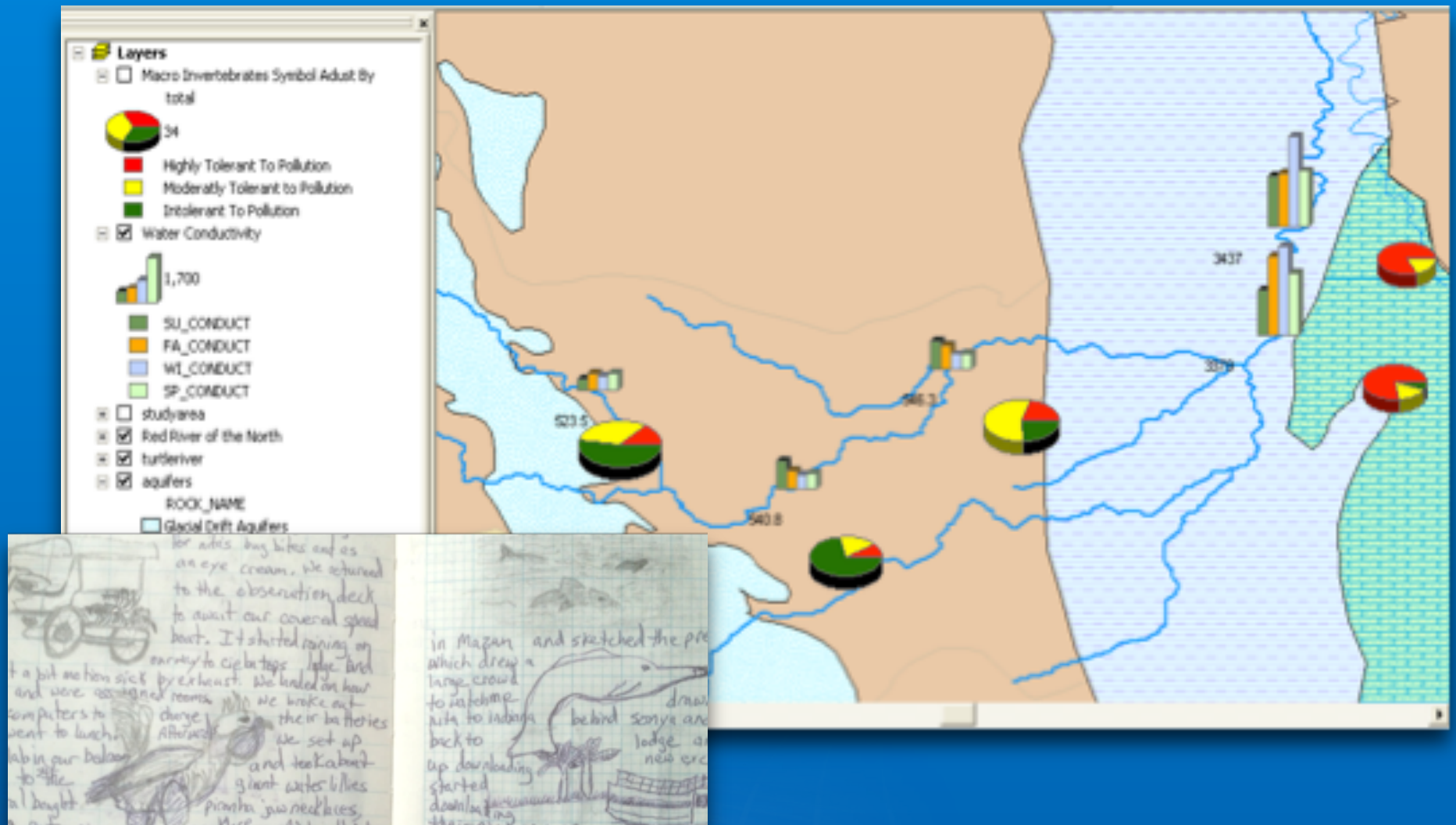
- pH probes with GPS
- SO₂ via bioindicator
- AirQuality Egg



Sound Mapping



Off-peak/Peak images: Western Albemarle students in JMU's Geospatial Semester



Stream Monitoring

source: Bishop Dunne Highschool, Dallas

The GeoMentor Program

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GIS professionals can help educators and students learn to use GIS. A GeoMentor is a volunteer who can help a teacher or youth club leader build capacity to help kids use GIS.

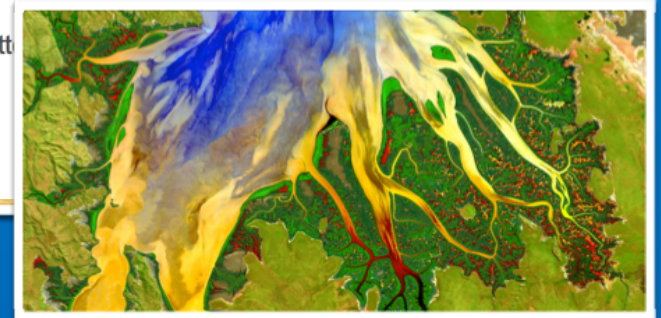
A GeoMentor works with an educator. Using tools of geography (such as digital or hardcopy maps), and even field work, the GeoMentor helps the educator and youth develop skills in geographic thinking.



Who can be a GeoMentor?

GeoMentors can be anyone who uses geography, recognizes the ways in which geography matters, and has an interest in helping young people, including:

- users of **Geographic Information Systems**
- Mapmakers



GeoMentor!

<http://geomentor.org>

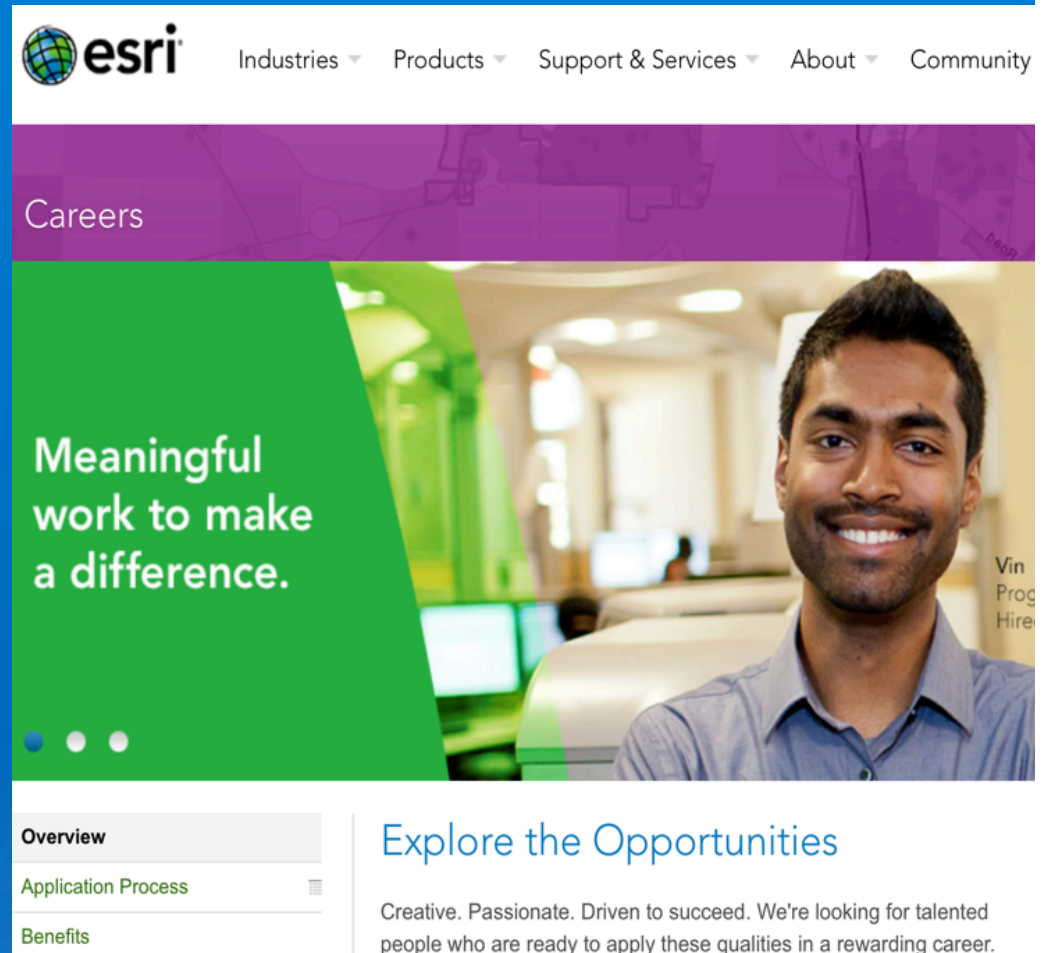
GIS Opportunities for College Students

Summer Internships

UC Student Assistantships

www.esri.com/careers

Developers.arcgis.com



The screenshot shows the Esri Careers website. At the top is the Esri logo and a navigation menu with links for Industries, Products, Support & Services, About, and Community. Below this is a purple banner with the word "Careers". The main content area features a large green and white graphic with the text "Meaningful work to make a difference." and a photo of a smiling man. To the right of the photo is the text "Vin Prog Hire". Below the main graphic is a sidebar with a table of contents: Overview, Application Process, and Benefits. The main content area also includes a section titled "Explore the Opportunities" with the text "Creative. Passionate. Driven to succeed. We're looking for talented people who are ready to apply these qualities in a rewarding career."

esri Industries Products Support & Services About Community

Careers

Meaningful work to make a difference.

Vin Prog Hire

Overview

Application Process

Benefits

Explore the Opportunities

Creative. Passionate. Driven to succeed. We're looking for talented people who are ready to apply these qualities in a rewarding career.



Thank you!

*Tom Baker * Ed Crane*